

## **SYMPATHETIC Thermoregulation**

Kiyatkin EA. Functional Role of Peripheral Vasoconstriction: Not Only Thermoregulation but Much More. *J Integr Neurosci*. 2021 Sep 30;20(3):755-764.  
<https://pubmed.ncbi.nlm.nih.gov/34645109/>

Peripheral Vasoconstriction is a centrally mediated mechanism by which body temperature is adjusted during exposure to cold temperatures. However, peripheral vasoconstriction is sympathetically activated, so also occurs following exposure to many different stimuli.

Triggered by sympathetic activation, constriction of blood vessels in the skin and most internal organs results in redistribution of blood to the muscles, but also to the brain. There is dilation to cerebral vessels, increased global cerebral blood flow, and enhanced intra-brain entry of oxygen and glucose from the arterial blood. This powerful influence determines the long duration of physiological increases in both brain temperature and brain levels of glucose and oxygen, and their uniform distribution across different brain structures.

Note that norepinephrine cannot cross the blood-brain barrier. That means that it influences brain temperature and oxygen by changing cardiac activity and vascular tone, creating a sensory signal that reaches the CNS via sensory nerves.